ET 93-59

UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

93-59

June 11, 1993

MEMORANDUM FOR William Torak
Spectrum Engineering Division
Federal Communications Commission

DOCKET FILE COPY ORIGINAL

FROM: William Gamble
Office of Spectrum Management

SUBJECT: NTIA Standards for Wind Profilers a 449 MHz

As you are well aware, NTIA, in consultation with the

ATTACHMENT 1

Criteria E: Standard for all wind profiler radars operating on 449 MHz

Add:

5.3.4 Criteria E

1. Effective Dates
    Technical criteria for new wind profiler radars (WPR) operating on 449 MHz shall become effective on 1 January 1994. (New WPRs are those for which the initial system procurement contract is let after 1 January 1994.)

2. Applicability
    These criteria are applicable to WPR's operating on 449 MHz.

3. Emission Bandwidth
    The emission bandwidth for WPR's at the antenna input shall not exceed the following limits:

NOTE: Footnote Gxxx requires that the -20 dB bandwidth for WPRs operating at 449 MHz shall not exceed 2 MHz.

3.1   For non-FM pulse radars (including coded pulse radars):

$$B(-40 \text{ dB}) = 6.2/(t_r t)^{1/2} \text{ or } 64/t, \text{ whichever is less.}$$

3.2   For FM-pulse radars (intentional FM):

$$B(-40 \text{ dB}) = 6.2/(t_r t)^{1/2} + 2(B_c + 0.105/t_r)$$

3.3   For wind profiler radars, an operational justification shall be provided if the pulse rise time, t_r, is less than 0.01 microsecond.

3.4   For CW radars

$$B(-40 \text{ dB}) = 0.003 \, F_0$$

3.5   For FM/CW radars

$$B(-40 \text{ dB}) = 0.003 \, F_0 + 2 \, B_d$$

8. EMC Provision

WPR's shall have the capacity to tolerate incoherent pulsed interference of duty cycle less than 1.5 percent such that peak interfering signal levels 30 dB greater than the WPR receiver noise level at the IF output will not degrade WPR performance.

9. Measurement capability

In order to coordinate radar operations in the field, an accurate measurement of the operating frequency is necessary. An accuracy of 1.0 part per million is adequate. Of comparable importance is the capability to measure pulse rise time and spectrum occupancy.

Figure 3. Radar Emission Bandwidth and Emission Levels
for Wind Profiler Radars Operating at 449 MHz
(Criteria E)
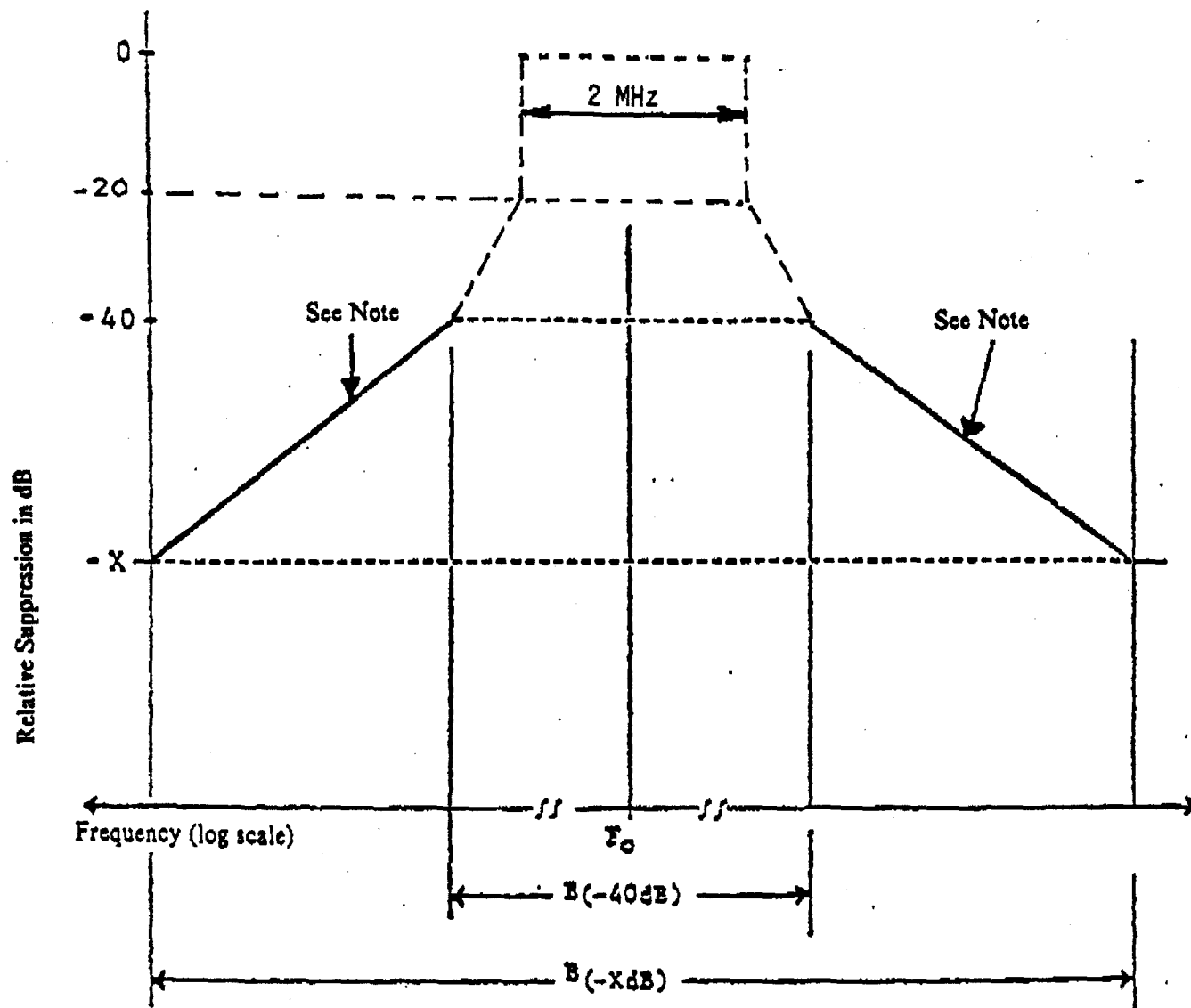
NOTE: The roll-off slope, S, from the -40 dB to -X dB points is at 40 dB per decade for Criteria E. The -20 dB bandwidth is limited to 2 MHz for Wind Profiler radars operating at 449 MHz. The maximum emission spectrum level between the -40 dB and -X dB points for S dB per decade slope is described by the formula:

$$\text{Suppression (dB)} = - S \cdot \log \left| \frac{F - F_o}{\tfrac{1}{2}B(-40dB)} \right| - 40$$

$$\text{where:} \quad \tfrac{1}{2}B(-40dB) \leq \left| F - F_o \right| \leq \tfrac{1}{2}B(-XdB)$$

$$\text{and:} \quad B(-XdB) = (10^a) \, B(-40dB)$$

$$a = \frac{X-40}{S}$$